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### (54) RESIN-CERAMIC COMPOSITE MATERIAL AND WIRING BOARD FOR ELECTRONIC PARTS USING THE COMPOSITE MATERIAL

#### (57)Abstract:

PURPOSE: To generate a high dielectric constant and low dielectric tangent in a high frequency reange of giga-hertz band and also enhance the formability and dimensional accuracy by using a mixture of a dielectric ceramic and organic high polymer resin.

CONSTITUTION: A dielectric ceramic powder of BaO-Nd<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>-Bi<sub>2</sub>O<sub>3</sub>-Mn series having a high dielectric constant and low dielectric tangent (low tan $\delta$ ) (high Q value) is mixed with an organic high polymer resin, and the resultant mixture is subjected to a shaping process. The dielectric tangent of the dielectric ceramic powder is improved to a great extent by adding Mn along with further enhancement of the dielectric constant, and also the dielectric constant dependency upon the temperature is lessened and also stabilized. Examples of the organic high polymer resin are epoxy, phenol, or silicon resin. Thereby a high dielectric constant over four and low dielectric tangent less than  $14 \times 10^{-4}$  are obtained in the giga-hertz band, and further an excellent shaping property and dimensional accuracy can be ensured.

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